AMENDMENTS TO THE CLAIMS

1. (Original) A method of fabricating an optical sensor comprising the steps of:

providing a silicon substrate having a first surface and a second surface;

providing a region comprising essentially of silicon dioxide on or in the first surface of the silicon substrate;

etching a channel into the silicon substrate from said second surface up to said silicon dioxide region, said channel being sized to receive an optical fibre whereby said silicon dioxide region forms an end portion of said channel which at least partially closes said channel; and

coating at least a portion of the silicon dioxide region with a coating to form an environmentally-sensitive element.

2. (Original) A method of fabricating an optical sensor as claimed in claim 1, wherein the silicon substrate and silicon dioxide region form a single substrate element.

3. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 1, wherein the silicon substrate is monolithic.

4. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 1, wherein the step of providing said silicon dioxide region comprises oxidising a portion of said first surface of said silicon substrate.

5. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 1, wherein the step of providing said silicon dioxide region comprises etching at least one continuous groove in the first surface of said silicon substrate and thereafter forming silicon dioxide in said at least one continuous groove.

6. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 1, further comprising the step of forming at least one projection comprising essentially of silicon dioxide on said silicon dioxide region.

7. (Original) A method of fabricating an optical sensor as claimed in claim 6, wherein the step of forming at least one projection comprises providing a layer of silicon over said silicon dioxide region; etching the layer of the silicon to form at least one structure projecting outwardly from said silicon dioxide region; and thereafter oxidising the at least one structure to form said at least one projection.

8. (Original) A method of fabricating an optical sensor as claimed in claim 6, wherein the step of forming at least one projection comprises etching the first surface of said silicon substrate to form at least one structure projecting outwardly from the silicon substrate and thereafter oxidising at least a portion of the first surface of said silicon substrate including the projecting structure to form said silicon dioxide region and said at least one projection.

9. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 7, wherein the step of etching the silicon comprises etching at least two concentric grooves to form one or more continuous projecting walls.

10. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 7, wherein the step of etching the silicon comprises etching two or more linear parallel grooves to form at least one planar projecting wall.

11. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 7, wherein the step of etching the silicon comprises etching a plurality of enclosed grooves to form a plurality of freestanding projections.

12. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 6, wherein the profile of the silicon dioxide projection is tapered.

13. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 1, wherein the step of coating at least a portion of the silicon dioxide region to form an environmentally-sensitive element comprises coating at least a portion of the silicon dioxide region with a luminescent material.

14. (Previously Presented) A method of fabricating an optical sensor as claimed in claim 1, wherein the silicon dioxide region includes a shoulder to define a constriction at the end

portion of the channel and the step of coating at least a portion of the silicon dioxide region to form an environmentally-sensitive element comprises coating a region of silicon dioxide that closes the constricted end of the channel with a reflective material.

15. (Original) A method of fabricating an optical sensor as claimed in claim 14, further comprising the step of etching a region of silicon dioxide that closes the constricted end of the channel after the reflective material has been applied.

Claims 16-24 (Canceled)

25. (Original) A method of fabricating a plurality of optical sensors on a common substrate comprising the steps of:

providing a silicon substrate having a first surface and a second surface;

providing at least two regions each comprising essentially of silicon dioxide on or in the first surface of the silicon substrate;

coating at least a portion of each silicon dioxide region with a coating to form an environmentally-sensitive element; and

etching at least one channel into the silicon substrate from said second surface up to one or more of said silicon dioxide regions, the channel being sized to receive an optical fibre whereby said one or more silicon dioxide region forms an end portion of the channel which at least partially closes said channel.

26. (Original) A method of fabricating a plurality of optical sensors as claimed in claim 25, wherein the step of etching at least one channel comprises etching a plurality of channels, each channel being sized to receive an optical fibre and whereby each silicon dioxide region forms an end portion of the respective channel which at least partially closes said channel.

27. (Original) A method of fabricating a plurality of optical sensors as claimed in claim 25, wherein the step of etching at least one channel comprises etching a single channel optically coupled to each environmentally-sensitive element.

28. (Original) An optical sensor comprising:

a silicon substrate having a first surface and an opposed second surface;

a channel extending into the silicon substrate from said second surface, said channel being sized to receive an optical fibre and having an end portion distant from said second surface, said end portion at least partially closing said channel and comprising essentially of silicon dioxide; and

a coating disposed over at least a region of the silicon dioxide to define an environmentally-sensitive element.

29. (Original) An optical sensor as claimed in claim 28, wherein the silicon substrate and silicon dioxide forms a single substrate element.

30. (Previously Presented) An optical sensor as claimed in claim 28, wherein the silicon dioxide includes a shoulder to define a constriction at the end portion of the channel and the coating comprises a reflective material that covers a region of silicon dioxide that closes the constricted end of the channel.

31. (Previously Presented) An optical sensor as claimed in claim 28, wherein the silicon dioxide only partially closes the channel to create an opening in the end portion of the channel and the coating comprises a reflective material that covers a region of silicon dioxide surrounding the opening and extends over the opening.

32. (Previously Presented) An optical sensor as claimed in claim 28, wherein said silicon dioxide comprises at least one projection and the coating is a luminescent coating applied over at least a portion of the at least one projection.

Claims 33-37 (Canceled)

38. (Original) A sensor system comprising a plurality of optical sensors on a common substrate having a first surface and an opposing second surface and a channel extending into the common substrate from said second surface, said channel being sized to receive an optical fibre, each optical sensor comprising:

an end portion distant from said second surface at least partially closing said channel and comprising essentially of silicon dioxide;

an optical coupling associated with said end portion; and

at least one of said optical sensors further comprising an environmentally-sensitive element for optical coupling with an optical fibre by means of said optical coupling.

Claims 39-42 (Canceled)

43. (New) The optical sensor of claim 28, wherein said coating is reflective such that the optical sensor is sensitive to pressure.

44. (New) A sensor system comprising:

a first optical sensor and a second optical sensor,

wherein the first optical sensor comprises the optical sensor of claim 43,

wherein the second optical sensor is adapted for measuring a parameter selected from temperature, fluid flow, pH, oxygen concentration, carbon dioxide concentration, glucose concentration, lactate concentration, bicarbonate ion concentration, chlorine ion concentration, sodium and potassium ion concentration,

wherein the second optical sensor is formed on the same silicon substrate as the first optical sensor, and

wherein the second optical sensor comprises a layer of silicon dioxide covering at least a region of the first surface of the substrate and at least one structure comprising essentially of silicon dioxide projecting outwardly from the silicon dioxide layer and having a luminescent material covering at least a portion of said silicon dioxide structure and a channel extending from

the second surface of the substrate to said silicon dioxide layer and aligned with said silicon dioxide structure.